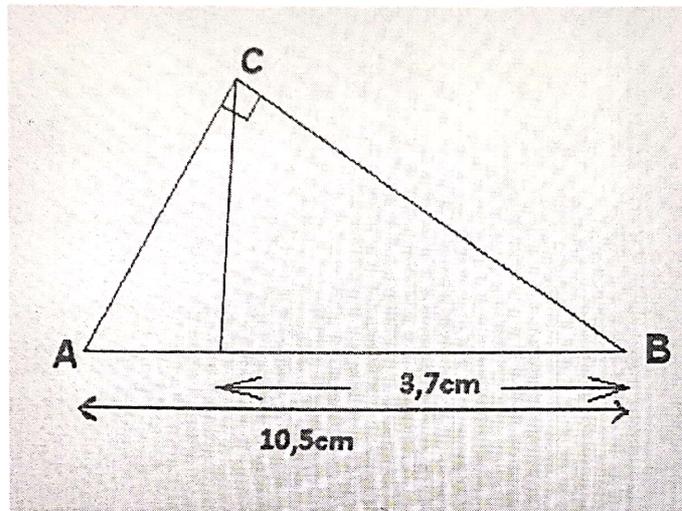


1.- a) (1 punto) Calcular el perímetro y el área de la siguiente figura calculando previamente los lados desconocidos (indicando los teoremas que utilizas para ello).

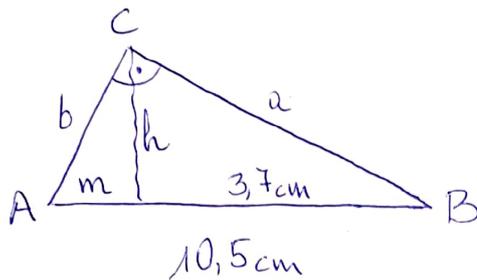


1.- (2 puntos) Si $\cotg \alpha = -\frac{4}{3}$ y $\frac{\pi}{2} \leq \alpha \leq \pi$ hallar las restantes razones trigonométricas.

2.- (2 puntos) Calcular, trasladando a razones trigonométricas de ángulos del primer cuadrante:

$$\frac{1}{\sqrt{3}} \operatorname{sen} 1320^\circ - 6 \cos 870^\circ + \cotg (-420^\circ)$$

① a)



$$m = 10,5 - 3,7 = 6,8 \text{ cm}$$

$$S = \frac{1}{2} c \cdot h$$

$$h^2 = 6,8 \cdot 3,7 \quad (\text{T}^2 \text{ Altura})$$

$$h^2 = 25,16 \Rightarrow \underline{h = 5,02 \text{ cm}}$$

$$S = \frac{1}{2} \cdot 10,5 \cdot 5,02 = \boxed{26,36 \text{ cm}^2}$$

$$P = a + b + 10,5$$

$$\text{Por T}^2 \text{ Cateto: } a^2 = 10,5 \cdot 3,7 = 38,85 \Rightarrow \underline{a = 6,23 \text{ cm}}$$

$$b^2 = 10,5 \cdot 6,8 = 714 \Rightarrow \underline{b = 8,45 \text{ cm}}$$

$$P = 6,23 + 8,45 + 10,5 = \boxed{25,18 \text{ cm}}$$

$$\textcircled{1} \cotg \alpha = -\frac{4}{3} \text{ y } \frac{\pi}{2} \leq \alpha \leq \pi \Rightarrow \alpha \in \text{II}$$

$$\hookrightarrow \boxed{\text{tg} \alpha = \frac{1}{\cotg \alpha} = -\frac{3}{4}}$$

$$1 + \text{tg}^2 \alpha = \sec^2 \alpha \Rightarrow 1 + \left(-\frac{3}{4}\right)^2 = \sec^2 \alpha \Rightarrow 1 + \frac{9}{16} = \sec^2 \alpha \Rightarrow$$

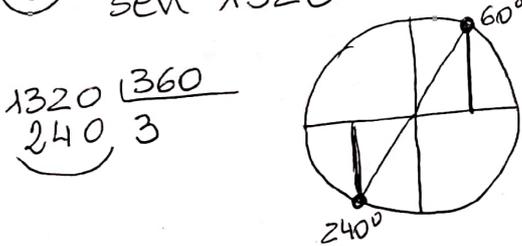
$$\Rightarrow \frac{25}{16} = \sec^2 \alpha \Rightarrow \sec \alpha = \pm \sqrt{\frac{25}{16}} \left. \begin{array}{l} \sec \alpha = -\frac{5}{4} \\ \cos \alpha = -\frac{4}{5} \end{array} \right\} \alpha \in \text{II}$$

$$\text{tg} \alpha = \frac{\text{sen} \alpha}{\cos \alpha} \Rightarrow -\frac{3}{4} = \frac{\text{sen} \alpha}{-\frac{4}{5}} \Rightarrow$$

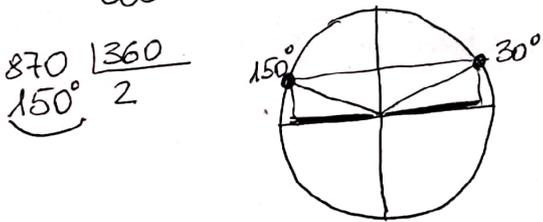
$$\Rightarrow -\frac{3}{4} \cdot \left(-\frac{4}{5}\right) = \text{sen} \alpha \Rightarrow \boxed{\text{sen} \alpha = \frac{3}{5}}$$

$$\hookrightarrow \boxed{\text{cosec} \alpha = \frac{1}{\text{sen} \alpha} = \frac{5}{3}}$$

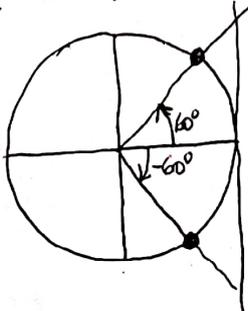
$$\textcircled{2} \text{sen } 1320^\circ = \text{sen } 240^\circ = -\text{sen } 60^\circ = -\frac{\sqrt{3}}{2}$$



$$\cos 870^\circ = \cos 150^\circ = -\cos 30^\circ = -\frac{\sqrt{3}}{2}$$



$$\cotg (-420^\circ) = \cotg (-60^\circ) = \frac{1}{\text{tg} (-60^\circ)} = \frac{1}{-\text{tg} 60^\circ} = \frac{1}{-\sqrt{3}} = -\frac{\sqrt{3}}{3}$$



$$\frac{1}{\sqrt{3}} \cdot \text{sen } 1320^\circ - 6 \cos 870^\circ + \cotg (-420^\circ) = \frac{1}{\sqrt{3}} \cdot \left(-\frac{\sqrt{3}}{2}\right) - 6 \cdot \left(-\frac{\sqrt{3}}{2}\right) - \frac{\sqrt{3}}{3}$$

$$= -\frac{1}{2} + 3\sqrt{3} - \frac{\sqrt{3}}{3} = \frac{-3 + 18\sqrt{3} - 2\sqrt{3}}{6} = \boxed{\frac{-3 + 16\sqrt{3}}{6}}$$